

DOCKET NO: 294818US0PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
ANTON ESSER, ET AL. : EXAMINER: CORDRAY, D. R.
SERIAL NO: 10/590,933 :
FILED: AUGUST 28, 2006 : GROUP ART UNIT: 1791
FOR: METHOD FOR PRODUCING :
PAPER, PAPERBOARD AND
CARDBOARD

APPEAL BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

This is an appeal of the Final Rejection dated August 11, 2009 of Claims 1-15, 17 and 18. A Notice of Appeal was timely filed on January 11, 2010.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is BASF SE, having an address at 67056 Ludwigshafen, Germany.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals, interferences, or judicial proceedings which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 1-15, 17 and 18 stand rejected and are herein appealed. Claim 16 has been canceled.

IV. STATUS OF THE AMENDMENTS

An amendment under 37 CFR 1.116 was filed on December 24, 2009. An Advisory Action dated December 28, 2009 (first Advisory Action) indicated that the amendment would not be entered. Following a discussion with the Examiner on January 5, 2010, as reflected in an Interview Summary mailed January 14, 2010, a further Advisory Action of that mailing date (second Advisory Action), indicates that the amendment, and a Declaration under 37 CFR 1.132 filed December 24, 2009, will be entered. The second Advisory Action indicates that the rejection of Claims 13-17 under 35 U.S.C. § 112, second paragraph, was withdrawn.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

A summary of the claimed subject matter, as claimed in independent Claims 1 and 9, is mapped out below, with reference to page and line numbers in the specification added in **[bold]** after each element.

Claim 1: A process for producing paper, board or cardboard by draining a paper stock comprising interfering substances in the presence of polymers which comprise vinylamine units and which have an average molar mass M_w of at least 1 million, **[page 2, lines 8-10]** comprising preparing a high-consistency paper stock, **[page 2, lines 10-11]** metering at least one polymer comprising vinylamine units and having an average molar mass M_w of at least 1 million and a degree of hydrolysis of from 1 to 20 mol% into the high-consistency stock,

[page 2, lines 11-13] diluting with water the high-consistency stock to a low-consistency stock, [page 2, lines 13-14] and draining the low-consistency stock. [page 2, lines 14-15]

Claim 9: A method for reducing deposits in at least one of the wire part, press section and drying section of a paper machine in the production of paper, board or cardboard, [page 5, lines 20-21] comprising adding at least one hydrolyzed homo- or copolymer of a N-vinylcarboxamide having a degree of hydrolysis of from 1 to 20 mol% and an average molar mass Mw of at least 1 million as an additive to a high-consistency stock containing interfering substances [page 5, lines 17-20].

VI. GROUNDS OF REJECTION

Ground (A)

Claims 1, 4-10, 13-15 and 17-18 stand rejected under 35 U.S.C. § 103(a) as unpatentable over US 5,501,774 (Burke) in view of US 6,797,785 (Hund et al).

Ground (B)

Claims 1-15 and 17-19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over US 6,083,348 (Auhorn et al) in view of US 4,444,667 (Burkert et al) as evidenced by US 4,753,710 (Langley et al).

Ground (C)

Claims 1-3, 5-8 and 9 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting over Claims 1, 5, 6, 8-10 and 12 of copending Application No. 11/719,826 ('826 application) in view of Auhorn et al.

Ground (D)

Claims 1-3, 5-6 and 8 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting over Claims 1, 2 and 6 of copending Application No. 11/574,677 ('677 application) in view of Auhorn et al.

Ground (E)

Claims 1-3, 5, 6, 8 and 9 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting over Claims 1-5 of copending Application No. 12/065,688 ('688 application) in view of Auhorn et al.

VII. ARGUMENT

Ground (A)

Claims 1, 4-10, 13-15 and 17-18 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Burke in view of Hund et al. The rejection is untenable and should not be sustained.

As described in the specification at page 1, lines 10-34, homo- and/or copolymers of N-vinylformamide having varying degrees of hydrolysis have been used in the prior art as additives in the production of paper. The specification describes at page 1, lines 36-39 that although the polymers containing vinylamine units and disclosed in the above-discussed prior art are good fixing agents or drainage aids, flocculants and retention aids, problems with deposition in the wire part, press section and drying section of a paper machine still occur in practice when processing paper stocks containing interfering substances, such as coated broke. The paper machine then has to be shut down and cleaned.

The present invention successfully addresses these problems by using a polymer of the type discussed above, wherein the degree of hydrolysis is from 1 to 20 mol%, which polymer is added to a high-consistency paper stock, the high-consistency stock is diluted with water to a low-consistency stock, and the low-consistency stock is drained.

The specification herein contains comparative data demonstrating the significance of the present invention. Three different vinylamine-containing polymers differing in degree of hydrolysis were used, labeled as PVAm 1, PVAm 2 and PVAm 3, as described in the specification at page 7, lines 10-19. Example 1 is according to the present invention and employs PVAm 3 as the polymer. Comparative Examples 1-3 are otherwise the same as Example 1, except that in place of the PVAm 3, Comparative Example 1 employs a polyaluminum chloride, Comparative Example 2 employs PVAm 1, and Comparative Example 3 employs PVAm 2, as described in the specification at page 7, line 21 to page 8, line 30. In Example 1, after a run time of one month, the machine was routinely shut down and cleaned but the deposits on the machine were, however, not so serious that it would have been necessary to shut down the machine, as described in the specification at page 7, line 39 to page 8, line 2. In Comparative Example 1, the paper production had to be stopped after a machine run time of three days in order to remove troublesome deposits on the wire part, press section and drying section of the machine, as described in the specification at page 8, lines 9-12. Similar results as in Comparative Example 1 were realized for Comparative Example 2, as described in the specification at page 8, lines 18-21, and for Comparative Example 3, although the run time was four days therein, as described in the specification at paragraph, as described in the specification at page 8, lines 27-30.

In the Final Rejection, the Examiner finds that the above-discussed data is not commensurate in scope with the claimed invention. Particularly, the Examiner notes that

only one example according to the present invention was tested, in which a single polymer [PVAm 3] having a molecular weight of 2,000,000 and comprising 10 mol% of vinylamine units and 90 mol% N-vinylformamide units was added in an approximate amount of 0.009 wt% based on the coating broke train, a paper stock of 4% concentration was formed comprising coated broke and polymer, the stock diluted to 0.8% concentration, and paper formed.

To that end, the Esser Declaration of record contains three additional examples according to the invention and six comparative examples. Example 2 uses vinylamine-containing polymer PVAm 3, as discussed above. Example 3 uses new PVAm 4, which has the same molecular mass but 1 mol% vinylamine units and 99 mol% N-vinylformamide units. Example 4 uses new PVAm 5, which comprises 20 mol% of vinylamine units and 80 mol% of N-vinylformamide units. Examples 2, 3 and 4 were each tested using the same paper stock. Comparative Examples 4, 5 and 6 are analogous to Examples 2, 3 and 4, respectively, but add the polymer to the low-consistency stock, rather than to the high-consistency stock. Comparative Examples 7, 8 and 9 use the same paper stock as the above Examples and Comparative Examples, but employ comparative PVAm 1 and PVAm 2, which are described in the specification, and new PVAm 6 which is identical to inventive PVAm 3 with regard to relative amounts of vinylamine units and N-vinylformamide units, but has a molecular weight of 400,000 D. The Examples and Comparative Examples were evaluated as described in the Esser Declaration. The data is shown in the Table at paragraph 9 thereof. The data show superior results across the range recited in the claims of the degree of hydrolysis limitation of from 1 to 20 mol%, the significance of metering the polymer into the high-consistency stock, rather than to the low-consistency stock, and the significance of the minimum average molar mass limitation.

The above-applied prior art could not have predicted the above-discussed results.

Burke discloses nothing more than what Applicants have already acknowledged is known. Burke discloses preparing a high-consistency paper stock and then diluting with water to form a low-consistency stock, and adds a cationic coagulating agent to the thick stock. However, Burke does not distinguish from among the various such coagulating agents which may be used, and disclose, for example, polyaluminum chloride as an applicable coagulating agent (column 3, line 62) which, as discussed above for Comparative Example 1, is shown to be inferior. Burke does not disclose the presently-recited polymer. The Examiner thus relies on Hund et al. But Hund et al. does not recognize any significance in degree of hydrolysis of their polyvinylamine type polymers. Nor does Hund et al. suggest that their polyvinylamine type polymers are any better than, for example, the cationic coagulants of Burke.

Applicants continue to submit that neither Burke nor Hund et al., alone or in combination, disclose or suggest the use of the particular polymers of the present invention, having the recited degree of hydrolysis range and minimum average molar mass, and the importance of metering such a polymer to high-consistency paper stock before it is diluted with water to become a low-consistency paper stock.

Indeed, *no prima facie* case of obviousness has been made out, since the disclosure of homo- and/or copolymers of N-vinylformamide covers a wide range of utilities associated with paper-making, yet such a material is not disclosed for the present utility in either Burke or Hund et al.

In the first Advisory Action, the Examiner faults Esser's declaration at paragraph 6 of the Esser Declaration that "[a] good result with stock treatment is achieved when the total

number of pitch particles at a size above 15 μm has been reduced by more than 80% relative to the blank” because Esser uses the word “good” rather than “surprising or unobvious.”

In reply, the Examiner appears to have misinterpreted the above-excerpted declaration. Esser is referring to a line of demarcation between a good result and a “not good” result, i.e., a reduction by 80% or less relative to the blank. The data speak for themselves. As the data in the Esser Declaration show, the percent reduction for each of Additional Examples 2, 3, and 4 is 89%, 85%, and 83%, respectively. The highest percentage for all of the comparative examples was 52%, for Comparative Example 4. See paragraph 9 of the Esser Declaration. There is no expectation from the prior art that these numbers would vary based on the parameters of the present claims, i.e., the particular polymer used, its minimum average molecular mass, its degree of hydrolysis, or the type of paper stock (high-consistency or low-consistency) in which the polymer is metered, i.e., these parameters are not known to be result-effective variables, at least for the present utility. Since, as discussed above, there is no *prima facie* case of obviousness, Applicants were under no burden to provide surprising or non-obvious results although, it is respectfully submitted, the data in the specification combined with the Esser Declaration show such surprising and non-obvious results.

In the first Advisory Action, the Examiner finds that one of ordinary skill in the art “would have predicted that, in a more concentrated slurry (such as the thick stock), improved contact would be made between the vinylamine polymer and the pitch particles and better retention obtained.”

In reply, the Examiner has set forth no evidence in support of this finding and thus, it should be ignored. Nevertheless, even if true, this finding does not go to the other parameters, such as degree of hydrolysis, discussed above.

In the first Advisory Action, the Examiner finds that the showing is not commensurate in scope with the claims. Particularly, the Examiner finds that the copolymers exemplified have molecular weights “well above the claimed lower limit or well below the limit,” that “the basis for the addition [of the polymers] is not known (e.g. – per ton of coated broke, per ton of stock, etc.), etc.,” and that “[t]he claims embody polymers of any composition having any amount of vinylamine units, a degree of hydrolysis from 1-20% (hydrolysis of any species; N-vinylformamide is not necessarily the hydrolyzed species) having any molecular weight above one million and added in any amount to the stock. In addition, the claimed papermaking stock is not required to comprise coated broke or white pitch, but only interfering substances.”

In reply, since, as discussed above, there is no *prima facie* case of obviousness, there is no issue of whether the showing is commensurate in scope with the claims. Nevertheless, Applicants respectfully submit that the showing is sufficient to demonstrate a trend that all subject matter within the terms of the present claims would produce a result similar to that shown by the comparative data of record. Compare *In re Kollman*, 595 F.2d 48, 56, 201 USPQ 193, 199 (CCPA 1979).

Moreover, even if there were a *prima facie* case of obviousness, the Examiner has adopted a wrong approach. Evidence of patentability cannot be evaluated simply for its knock-down ability when there is a *prima facie* case. As stated in *In re Carleton*, 599 F.2d 1021, 1024, 202 USPQ 165, 168-69 (CCPA 1979):

If the applicant presents rebuttal evidence, the decision-maker must consider all of the evidence of record (both that supporting and that rebutting the *prima facie* case) in determining whether the subject matter as a whole would have been obvious. [footnote omitted] *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *In re Lewis*, 443 F.2d 389, 170 USPQ 84 (CCPA 1971). The correct procedure for considering rebuttal evidence was set forth by this court in *In re Rinehart*, *supra* at 1052, 189 USPQ at 147:

Though the burden of going forward to rebut the *prima facie* case remains with the applicant, the question of whether that burden has been successfully carried requires that the entire path to decision be retraced. An earlier decision should not, as it was here, be considered as set in concrete, and applicant's rebuttal evidence then be evaluated only on its knockdown ability. Analytical fixation on an earlier decision can tend to provide that decision with an undeservedly broadened umbrella effect. *Prima facie* obviousness is a legal conclusion, not a fact. Facts established by rebuttal evidence must be evaluated along with the facts on which the earlier conclusion was reached, not against the conclusion itself. Though the tribunal must begin anew, a final finding of obviousness may of course be reached, but such finding will rest upon evaluation of all facts in evidence, uninfluenced by any earlier conclusion reached by an earlier board upon a different record.

In addition, it is not clear what the Examiner means by “basis for the addition is not known.” Since the Esser Declaration employs a mixing amount of “400 g/t,” which is the same amount used in the examples and comparative examples in the specification, it necessarily follows that the reference amount basis is the same, i.e., based on the coated broke, as described in the specification at page 7, lines 30-31.

In the first Advisory Action, the Examiner cites case precedent for the proposition that one cannot show non-obviousness by attacking references individually where the rejections are based on combinations of references.

In reply, Applicants' arguments are drawn to the rejection and rationale thereof.

Claim 5

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 5 is separately patentable, because it is closer in scope than Claim 1 to the scope of such evidence of patentability.

Claim 6

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 6 is separately patentable, because it is closer in scope than Claim 1 to the scope of such evidence of patentability.

Claim 9

Claim 9 is separately patentable because the applied prior art does not specifically disclose a method for reducing deposits in at least one of the wire part, press section and drying section of a paper machine in the production of paper, board or cardboard.

Claim 10

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 10 is separately patentable, because it is closer in scope than Claim 1 to the scope of such evidence of patentability.

Claim 14

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 14 is separately patentable, because it is closer in scope than Claim 9 to the scope of such evidence of patentability.

Claim 15

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 15 is separately patentable, because it is closer in scope than Claim 9 to the scope of such evidence of patentability.

Claim 18

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 18 is separately patentable, because it is closer in scope than Claim 9 to the scope of such evidence of patentability.

For all the above reasons, it is respectfully requested that the rejection be REVERSED.

Ground (B)

Claims 1-15 and 17-19 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Auhorn et al in view of Burkert et al as evidenced by Langley et al. The rejection is untenable and should not be sustained.

Everything discussed above under Ground (A) with regard to the prior art described in the specification, Applicants' improvement, and the comparative data in the specification and the Esser Declaration, is incorporated herein by reference. Again, the applied prior art in this rejection discloses nothing more than what Applicants have already acknowledged is known in the art. While Auhorn et al may be drawn to the presently-claimed paper-making utility,

the Examiner concedes that Auhorn et al discloses no degree of hydrolysis of polymers containing vinylamine units. Burkert et al, on the other hand, is drawn to a flocculant for sludge, not paper-making. In addition, Burkert et al discloses a degree of hydrolysis of 10 to 90%. Such a degree of hydrolysis is so broad as to be practically meaningless, i.e., degree of hydrolysis is not important. Without the present disclosure as a guide, one skilled in the art would not have combined Auhorn et al and Burkert et al, with or without Langley et al, but if combined, could not have predicted the superior results of record obtained by the present invention.

Applicants' response to the findings of the Examiner in the first Advisory Action, as discussed under Ground (A) above, is hereby incorporated by reference.

Claim 5

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 5 is separately patentable, because it is closer in scope than Claim 1 to the scope of such evidence of patentability.

Claim 6

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 6 is separately patentable, because it is closer in scope than Claim 1 to the scope of such evidence of patentability.

Claim 9

Claim 9 is separately patentable because the applied prior art does not specifically disclose a method for reducing deposits in at least one of the wire part, press section and drying section of a paper machine in the production of paper, board or cardboard.

Claim 10

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 10 is separately patentable, because it is closer in scope than Claim 1 to the scope of such evidence of patentability.

Claim 14

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 14 is separately patentable, because it is closer in scope than Claim 9 to the scope of such evidence of patentability.

Claim 15

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 15 is separately patentable, because it is closer in scope than Claim 9 to the scope of such evidence of patentability.

Claim 18

To the extent the Board finds any validity in the Examiner's finding of a *prima facie* case of obviousness and that the evidence of patentability of record is not commensurate in scope with the claims, Claim 18 is separately patentable, because it is closer in scope than Claim 9 to the scope of such evidence of patentability.

For all the above reasons, it is respectfully requested that the rejection be REVERSED.

Ground (C)

Claims 1-3, 5-8 and 9 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting over Claims 1, 5, 6, 8-10 and 12 of '826 application in view of Auhorn et al. The rejection is untenable and should not be sustained.

The claims of the '826 application are drawn to a process for producing paper, etc. by separately adding a polymer comprising vinylamine units and a polymeric anionic compound to a paper pulp, dewatering and drying. There is nothing in the claims of the '826 application with regard to high-consistency stocks and low-consistency stocks. More significantly, there is nothing in the claims of the '826 application, or in Auhorn et al., regarding the significance of the presently-required limitation of degree of hydrolysis, nor any recognition of the superior results obtained thereby.

In the Final Rejection, the Examiner finds that "[t]he copending applications claim a degree of hydrolysis overlaying the claimed ranges. One of ordinary skill in the art would have found it obvious to use the method of addition of [Auhorn et al.] for the vinylamine

polymer and other retention aid to obtain the currently claimed subject matter and have a reasonable expectation of success.”

In reply, the at least 10 mol% of vinylamine units in Claim 9 of the ‘826 application suggests nothing at all about the significance of the presently-recited range of 1 to 20 mol%, nor has the Examiner responded to other arguments made by Applicants, such as no distinction between high-consistency stocks and low-consistency stocks, as well as other differences.

For all the above reasons, it is respectfully requested that the rejection be REVERSED.

Ground (D)

Claims 1-3, 5-6 and 8 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting over Claims 1, 2 and 6 of ‘677 application in view of Auhorn et al. The rejection is untenable and should not be sustained.

Claims 1-8 in ‘677 application have been canceled and replaced with Claims 9-18. The claims of the ‘677 application are drawn to a process for producing paper, etc. by draining a paper stock on a wire in the presence of at least one polymer as a retention aid, wherein sheet formation is carried out in the absence of finely divided inorganic flocculants and at least two different types of polymers, one comprising a hydrolyzed polyvinylformamide. There is nothing in the claims of the ‘677 application with regard to high-consistency stocks and low-consistency stocks. More significantly, there is nothing in the claims of the ‘677 application, or in Auhorn et al., regarding the significance of the presently-required limitation of degree of hydrolysis, nor any recognition of the superior results obtained thereby.

In the Final Rejection, the Examiner finds that “[t]he copending applications claim a degree of hydrolysis overlaying the claimed ranges. One of ordinary skill in the art would have found it obvious to use the method of addition of [Auhorn et al] for the vinylamine polymer and other retention aid to obtain the currently claimed subject matter and have a reasonable expectation of success.”

In reply, the degree of hydrolysis of vinylformamide units of from 0.5 to 50% in Claim 9 of the ‘677 application suggests nothing at all about the significance of the presently-recited range of 1 to 20 mol%, nor has the Examiner responded to other arguments made by Applicants, such as no distinction between high-consistency stocks and low-consistency stocks, as well as other differences.

For all the above reasons, it is respectfully requested that the rejection be REVERSED.

Ground (E)

Claims 1-3, 5, 6, 8 and 9 stand provisionally rejected on the ground of nonstatutory obviousness-type double patenting over Claims 1-5 of copending Application No. 12/065,688 (‘688 application) in view of Auhorn et al. The rejection is untenable and should not be sustained.

The claims of the ‘688 application are drawn to a process for the production of paper, etc. by draining a paper stock with sheet formation in the presence of a retention aid system comprising three different polymers, one of them being a polymer comprising vinylamine units. There is nothing in the claims of the ‘688 application with regard to high-consistency stocks and low-consistency stocks. More significantly, there is nothing in the claims of the ‘688 application, or in Auhorn et al, regarding the significance of the presently-required

limitation of degree of hydrolysis, nor any recognition of the superior results obtained thereby.

In the Final Rejection, the Examiner finds that "[t]he copending applications claim a degree of hydrolysis overlaying the claimed ranges. One of ordinary skill in the art would have found it obvious to use the method of addition of [Auhorn et al] for the vinylamine polymer and other retention aid to obtain the currently claimed subject matter and have a reasonable expectation of success."

In reply, the degree of hydrolysis of vinylformamide units of from 0.5 to 100% in Claim 3 of the '688 application, suggests nothing at all about the significance of the presently-recited range of 1 to 20 mol%, nor has the Examiner responded to other arguments made by Applicants, such as no distinction between high-consistency stocks and low-consistency stocks, as well as other differences.

For all the above reasons, it is respectfully requested that the rejection be REVERSED.

VIII. CONCLUSION

For the above reasons, it is respectfully requested that all the rejections be REVERSED.

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Respectfully submitted,

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CLAIMS APPENDIX

Claim 1. A process for producing paper, board or cardboard by draining a paper stock comprising interfering substances in the presence of polymers which comprise vinylamine units and which have an average molar mass M_w of at least 1 million, comprising preparing a high-consistency paper stock, metering at least one polymer comprising vinylamine units and having an average molar mass M_w of at least 1 million and a degree of hydrolysis of from 1 to 20 mol% into the high-consistency stock, diluting with water the high-consistency stock to a low-consistency stock, and draining the low-consistency stock.

Claim 2. The process according to claim 1, wherein the consistency of the high-consistency stock is more than 2% by weight, based on dry paper stock, and the degree of hydrolysis of the polymers is from 3 to 15 mol%.

Claim 3. The process according to claim 1, wherein the consistency of the high-consistency stock is from 3.0 to 6.0% by weight, based on dry paper stock, and the degree of hydrolysis of the polymers is from 5 to 12 mol%.

Claim 4. The process according to claim 1, wherein the consistency of the high-consistency stock is from 3.5 to 4.5% by weight, based on dry paper stock, and wherein the consistency of the low-consistency stock is brought to a concentration below 1.5% by weight, based on dry paper stock.

Claim 5. The process according to claim 1, wherein polymers which comprise vinylamine units and are obtainable by hydrolysis of homo- and/or copolymers of N-vinylcarboxamides are used.

Claim 6. The process according to claim 5, wherein hydrolyzed homopolymers of N-vinylformamide having a degree of hydrolysis of from 1 to 20 mol% are used as polymers comprising vinylamine units.

Claim 7. The process according to claim 1, wherein at least one retention aid is metered into the low-consistency stock.

Claim 8. The process according to claim 1, wherein the amount of the polymers containing vinylamine units and metered into the high-consistency stock is from 0.002 to 0.1% by weight, based on dry paper stock.

Claim 9. A method for reducing deposits in at least one of the wire part, press section and drying section of a paper machine in the production of paper, board or cardboard, comprising adding at least one hydrolyzed homo- or copolymer of a N-vinylcarboxamide having a degree of hydrolysis of from 1 to 20 mol% and an average molar mass M_w of at least 1 million as an additive to a high-consistency stock containing interfering substances.

Claim 10. The process according to claim 1, wherein the high-consistency stock comprising interfering substances comprises coated broke.

Claim 11. The method according to claim 9, wherein the consistency of the high-consistency stock is more than 2% by weight, based on dry paper stock, and the degree of hydrolysis of the polymers is from 3 to 15 mol%.

Claim 12. The method according to claim 9, wherein the consistency of the high-consistency stock is from 3.0 to 6.0% by weight, based on dry paper stock, and the degree of hydrolysis of the polymers is from 5 to 12 mol%.

Claim 13. The method according to claim 9, wherein the consistency of the high-consistency stock is from 3.5 to 4.5% by weight, based on dry paper stock.

Claim 14. The method according to claim 9, wherein the at least one hydrolyzed homo- or copolymer of a N-vinylcarboxamide comprises vinylamine units.

Claim 15. The method according to claim 14, wherein hydrolyzed homopolymers of N-vinylformamide having a degree of hydrolysis of from 1 to 20 mol% are used as polymers containing vinylamine units.

Claim 17. The method according to claim 14, wherein the amount of the polymers containing vinylamine units and metered into the high-consistency stock is from 0.002 to 0.1% by weight, based on dry paper stock.

Claim 18. The method according to claim 9, wherein the high-consistency stock comprising interfering substances comprises coated broke.

EVIDENCE APPENDIX

Declaration under 37 CFR 1.132 of named coinventor Dr. Anton Esser (Esser Declaration) filed December 11, 2009 (unexecuted) and December 24, 2009 (executed).

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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :

Anton ESSER, et al. : EXAMINER: CORDRAY, D. R.

SERIAL NO.: 10/590,933 :

FILED: AUGUST 28, 2006 : GROUP ART UNIT: 1791

FOR: METHOD FOR PRODUCING PAPER, PAPERBOARD AND CARDBOARD

DECLARATION UNDER 37 C.F.R. §1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

I, Anton Esser, Dr. rer. nat., a citizen of the Federal Republic of Germany and residing at 24, Mainzerstraße, 67117 Limburgerhof, Federal Republic of Germany, declare as follows:

1. I am a fully trained physicist, having studied physics at the Technical University of Aachen, from 1981 to 1986; and at the Technical University of Aachen for the doctorate degree from 1987 – 1992;

I joined BASF SE of 67056 Ludwigshafen, Federal Republic of Germany, the assignee of the above-identified application, in 1992, and have worked in the research department of polymer physics for eight years;

I am a named inventor of the above-identified application.

I have been working on the development of paper additives, including polymers for filler treatment since 2000.

2. I am familiar with the claims, and have read the Office Action mailed August 11, 2009 in the above-identified application.

3. Under my supervision three new examples according to the invention and six comparative examples were carried out as follows:

4. The following additional polymers were used:

PVAm 4:

Polymer of 1 mol% of vinylamine units and 99 mol% of N-vinylformamide units, having a molecular mass of 2 million D (prepared by partial hydrolysis of poly-N-vinylformamide)

PVAm 5:

Polymer of 20 mol% of vinylamine units and 80 mol% of N-vinylformamide units, having a molecular mass of 2 million D (prepared by partial hydrolysis of poly-N-vinylformamide)

PVAm6:

Polymer of 10 mol% of vinylamine units and 90mol% of N-vinylformamide units, having a molecular mass of 400 000 D (prepared by partial hydrolysis of poly-N-vinylformamide)

5. Blank

Paper stock is prepared from the following components: 14 wt% pine sulfate, 34 wt% of bleached birch sulfate, 21 wt% of coated broke and 31 wt% of ground calcium carbonate. The components are mixed at 4 % consistency (based on dry paper stock) for 30 minutes.

After that the high consistency stock is diluted to 0,5 % consistency by adding water. The diluted stock is stirred at low speed for another 2 minutes. 250ml of the diluted stock is then filtered in a dynamic drainage jar using a screen with 80 µm wire opening. The number and size of white pitch particles in the filtrate is then counted using the BASF laser pitch counter. The principle of this instrument and the measurement have been described in: Nordic Pulp Paper Research Journal, Vol 9(1), page 26 – 30, (1994).

6. Additional Examples (2,3,4)

Paper stock is prepared from the following components: 14 wt% pine sulfate, 34 wt% of bleached birch sulfate, 21 wt% of coated broke and 31 wt% of ground calcium carbonate. The components are mixed at 4 % consistency (based on dry paper stock) for 15 minutes.

After mixing the 400 g/t of PVAm X (X = 3, 4, 5) is added to the stock and the stock is again mixed for 15 minutes. After that the high consistency stock is diluted to 0,5% consistency by adding water. The diluted stock is stirred at low speed for another 2 minutes. 250 ml of the diluted stock is then filtered in a dynamic drainage jar using a screen with 80 µm wire opening. The number and size of white pitch particles in the filtrate is then counted using the BASF laser pitch counter.

A good result with stock treatment is achieved when the total number of pitch particles at a size above 15 µm has been reduced by more than 80 % relative to the blank. This corresponds to the situation of the amount and size distribution of white pitch measured in the white water of the paper machine in case in Example 1.

7. Comparative Examples (4,5,6)

Paper stock is prepared from the following components: 14 wt% pine sulfate, 34 wt% of bleached birch sulfate, 21 wt% of coated broke and 31 wt% of ground calcium carbonate. The components are mixed at 4 % consistency (based on dry paper stock) for 30 minutes.

After that the high consistency stock is diluted to 0, 5% consistency by adding water. After dilution 400 g/t of PVAm X (X = 3, 4, 5) is added to the stock and the stock is again mixed for 15 minutes. The diluted stock is stirred at low speed for another 2 minutes. 250 ml of the diluted stock is then filtered in a dynamic drainage jar using a screen with 80 μ m wire opening. The number and size of white pitch particles in the filtrate is then counted using the BASF laser pitch counter.

8. Comparative Examples (7,8,9)

Paper stock is prepared from the following components: 14 wt% pine sulfate, 34 wt% of bleached birch sulfate, 21 wt% of coated broke and 31 wt% of ground calcium carbonate. The components are mixed at 4 % consistency (based on dry paper stock) for 15 minutes.

After mixing the 400 g/t of PVAm X (X = 1, 2, 6) is added to the stock and the stock is again mixed for 15 minutes. After that the high consistency stock is diluted to 0,5 % consistency by adding water. The diluted stock is stirred at low speed for another 2 minutes. 250 ml of the diluted stock is then filtered in a dynamic drainage jar using a screen with 80 μ m wire opening. The number and size of white pitch particles in the filtrate is then counted using the BASF laser pitch counter.

9. The results of Additional Examples 2, 3, 4 and Comparative Examples 4 – 9 are summarized in the following table:

	Polymer	Reduction in the number of pitch particles per volume at a particle size > 15 μm relative to blank [in %]
Additional Example 2	PVAm 3	89
Additional Example 3	PVAm 4	85
Additional Example 4	PVAm 5	83
Comparative Example 4	PVAm 3	52
Comparative Example 5	PVAm 4	44
Comparative Example 6	PVAm 5	48
Comparative Example 7	PVAm 1	39
Comparative Example 8	PVAm 2	31
Comparative Example 9	PVAm 6	42

10. These data directly demonstrate that on the one hand the invention is realizable in a broader scope of polyvinylamines (i.e. different degree of hydrolysis). Additionally, the Comparative Examples demonstrate that the addition of polyvinylamines to the low consistency stock lead to worse results in reduction of pitch particles, respectively in fixing of pitch particles.

11. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this application or any patent issuing thereon.

Signature

Date

DOCKET NO: 294818US0PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :

Anton ESSER, et al. : EXAMINER: CORDRAY, D. R.

SERIAL NO.: 10/590,933 :

FILED: AUGUST 28, 2006 : GROUP ART UNIT: 1791

FOR: METHOD FOR PRODUCING PAPER, PAPERBOARD AND CARDBOARD

DECLARATION UNDER 37 C.F.R. §1.132

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

I, Anton Esser, Dr. rer. nat., a citizen of the Federal Republic of Germany and residing at 24, Mainzerstraße, 67117 Limburgerhof, Federal Republic of Germany, declare as follows:

1. I am a fully trained physicist, having studied physics at the Technical University of Aachen, from 1981 to 1986; and at the Technical University of Aachen for the doctorate degree from 1987 – 1992;

I joined BASF SE of 67056 Ludwigshafen, Federal Republic of Germany, the assignee of the above-identified application, in 1992, and have worked in the research department of polymer physics for eight years;

I am a named inventor of the above-identified application.

I have been working on the development of paper additives, including polymers for filler treatment since 2000.

2. I am familiar with the claims, and have read the Office Action mailed August 11, 2009 in the above-identified application.

3. Under my supervision three new examples according to the invention and six comparative examples were carried out as follows:

4. The following additional polymers were used:

PVAm 4:

Polymer of 1 mol% of vinylamine units and 99 mol% of N-vinylformamide units, having a molecular mass of 2 million D (prepared by partial hydrolysis of poly-N-vinylformamide)

PVAm 5:

Polymer of 20 mol% of vinylamine units and 80 mol% of N-vinylformamide units, having a molecular mass of 2 million D (prepared by partial hydrolysis of poly-N-vinylformamide)

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9. The results of Additional Examples 2, 3, 4 and Comparative Examples 4 – 9 are summarized in the following table:

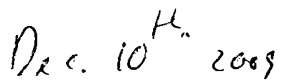
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Signature



Date

Application No. 10/590,933
Appeal Brief

RELATED PROCEEDINGS APPENDIX

None.